



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/612,226

07/01/2003

Alan F. Jankowski

IL-11019

7754

7590

07/07/2006

Ann M. Lee
Assistant Laboratory Counsel
Lawrence Livermore National Laboratory
P.O. Box 808, L-703
Livermore, CA 94551

EXAMINER

LEE, CYNTHIA K

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 07/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/612,226	JANKOWSKI ET AL.	
	Examiner	Art Unit	
	Cynthia Lee	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 14-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is responsive to the amendment filed on 6/1/2006. Claims 1-27 are pending. Claims 14-27 are withdrawn from further consideration as being drawn to a non-elected invention. Claims 1 and 13 have been amended.

The 35 USC 112, 2nd paragraph rejection has been withdrawn.

Applicant's arguments have been considered, but are not persuasive. Thus, claims 1-13 are finally rejected for reasons of record.

Specification

The applicant is requested to update the status of all non-provisional applications cited in the specification.

The disclosure is objected to because of the following informalities: The applicant is advised to spell out the acronym "MEMS". Appropriate correction is required.

Claims Analysis

The functional recitations in claims 9 and 10 have been considered but was not given patentable weight because it has been held by the courts that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (BdPatApp & Inter 1987). See MPEP 2115. It has been held by the courts that claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). See MPEP 2115.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "substantially" in claim 12 is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7, 9, 10, 12, 13 rejected under 35 U.S.C. 103(a) as being unpatentable over Maru (US 4365007) in view of Kelley (US 6268077) and Ito (US 5227258).

Maru discloses an apparatus comprising a fuel cell stack having a pair of electrodes including an anode and a cathode, and a thin film electrolyte disposed therebetween; a catalytic reactor having a manifold positioned in fluid communication with the fuel cell stack, the manifold adapted to convey a fuel to the anode and a catalyst

Art Unit: 1745

adapted to reform the fuel. The reform catalyst is located in the manifold and contacts the anode. See fig. 1 and 2:50-3:1-10.

Maru does not disclose the electrolyte comprising a solid oxide. However, Ito teaches of the advantages of solid oxide fuel cells (SOFCs) due to its high operating temperature, such as small polarization of expensive noble metal catalysts, high output voltage, stability and long life due to its components being solid (1:20-29). Thus, one of ordinary skill in the art at the time the invention was made using Ogawa's fuel cell stack would be motivated to use the fuel cell stack with solid oxide fuel cell plates for the benefit of achieving small polarization of expensive noble metal catalysts, high output voltage, stability and long life due to its components being solid, as taught by Ito.

Maru teaches a catalytic reactor, but does not disclose that the catalytic reactor is a microreactor. However, Kelley teaches that a fuel cell is used for portable power supply devices, such as cell phones or radios. Kelly teaches that the fuel cell device is contained in a volume less than 500 cubic meters. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make Maru's fuel cell apparatus less than 500 cubic centimeters for the benefit of utilizing Maru's fuel cell apparatus in a portable energy consuming device.

Maru does not expressly disclose a manifold comprising a flow passage having at least one dimension less than 5 millimeters. However, the size of the flow passage controls the amount of reactants flowing through the fuel cell, and thus affects the amount of gas being reformed and the amount of energy generated by the fuel cell. The size of the flow passage is a result effective variable and it has been held by the

Art Unit: 1745

courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP 2144.05.

Claim 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Maru (US 4365007) in view of Kelley (US 6268077) and Ito (US 5227258) as applied to claim 1 above, and further in view of Carter (US 2003/0232230).

Maru, Kelly, and Ito disclose all the elements of claim 1. Maru, Kelly, and Ito do not disclose that the electrolyte thickness is less than 10 micrometers. However, Carter teaches that thick electrolyte layer leads to relatively high electrical resistance and electrolyte thickness is about 5-20 micrometers in prior art [0010]. Thus, it would be have been obvious to one of ordinary skill in the art at the time the invention was made to make the electrolyte thickness less than 10 micrometers for the benefit of decreasing the electrical resistance, as taught by Carter.

Claim 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Maru (US 4365007) in view of Kelley (US 6268077) and Ito (US 5227258) as applied to claim 1 above, and further in view of Mallari (US 2003/0044674).

Maru, Kelly, and Ito disclose all the elements of claim 1. Maru, Kelly, and Ito do not disclose that the manifold includes at least one wall comprising silicon. However, Mallari teaches that some of the advantages of silicon platform provides include: (1) the

Art Unit: 1745

ability to uniformly carry a catalyst on a surface or within a bulk fluid flow-through matrix, (2), the ability when appropriately doped, to function as a current collector for the transmission of an electrical current, and (3) the ability to be selectively sculpted, metallized and processed into complicated structures via semiconductor micro-fabrication techniques [0028]. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the manifold comprising silicon for the benefit of easy manufacturing the fuel cell apparatus on a microscale.

Response to Arguments

Applicant's arguments filed 6/1/2006 have been fully considered but they are not persuasive.

Applicants assert that a prima facie case of obviousness was not established to cite the elements of a catalytic microcatalytic reactor particularly since Kelley does not suggest a catalytic reactor at all (pg. 6).

The Office respectfully disagrees.

Firstly, the applicant has not defined as to what he means by a "microreactor." Absent specific dimensions, the combination of Maru and Kelly teach the limitation of "a catalytic microreactor."

Further, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The Office reiterates that Maru discloses a catalytic reactor and Kelley teaches that a fuel cell is used for portable power supply devices, such as

Art Unit: 1745

cell phones or radios. Kelly teaches that the fuel cell device is contained in a volume less than 500 cubic meters. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make Maru's fuel cell apparatus less than 500 cubic centimeters for the benefit of utilizing Maru's fuel cell apparatus in a portable energy consuming device. This combination satisfies the Applicant's limitation of "a catalytic microreactor."

Applicant asserts that the Office has merely listed certain generic benefits of solid oxide fuel cells, but has not demonstrated a suggestion or motivation to modify prior art device "to run the way the apparatus is claimed" (emphasis in original).

The Office disagrees. The motivation that the Examiner listed were not merely generic benefits as applicants argue, but were benefits and advantages of a solid oxide fuel cell. The Examiner notes that proper motivation was presented, and thus the combination is proper.

Applicant argues that the combination of Maru, Kelley, and Ito does not run in the way of the apparatus of claim 1 runs.

In response to Applicant's arguments, 37 CFR 1.111(b) states, "A general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references does not comply with the requirements of the section." Applicant has failed to specifically

Art Unit: 1745

point out how the language of the claims patentably distinguishes them from the references.

All of applicants' presently filed arguments are only statements with no evidentiary support as to why the art rejections of record do not meet all the claimed limitations. Applicants have not specifically pointed out the errors of the Examiner's art rejections. Applicant must discuss the references applied against the claims, explaining how the claims avoid the references or distinguish from them.

Further, it has been held by the courts that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (BdPatApp & Inter 1987). See MPEP 2115. Further, an apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber* 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). See MPEP 2115.

The applicant argues impermissible hindsight.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a

Art Unit: 1745

reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ckl

Cynthia Lee

Patent Examiner


PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER